Shuffling

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Outline

Why Shuffle? A Motivating Example

The Problem

Question: What happens if our data has hidden patterns or ordering?

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Let's see with a concrete example...

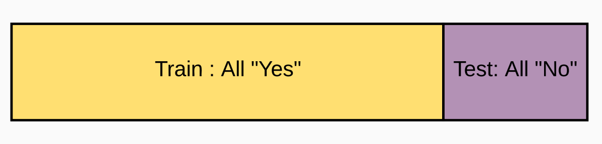
Consider this dataset

First 80 examples are of class "Yes"
Remaining 20 examples are of class "No".

Serial Number	**...**	**Class**
1		Yes
2		Yes
3		Yes
. .		. .
80		Yes
81		No
. .		. .
100		No

The Disaster: Ordered Data Split

With 80-20 train-test split on ordered data:



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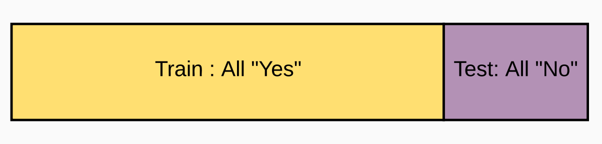

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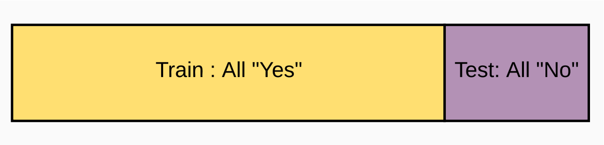

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- Training set: Only "Yes" examples
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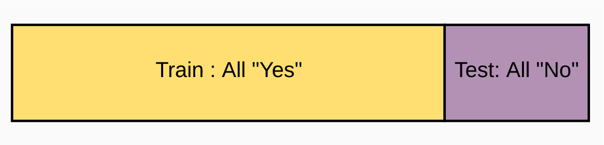

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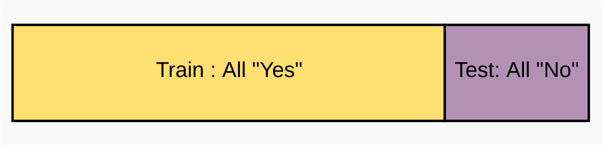

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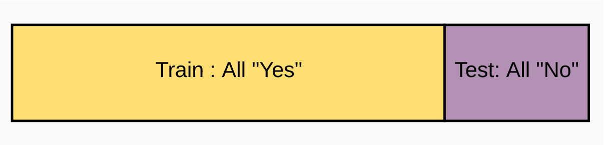

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Pop Quiz: Data Ordering

Quick Quiz 1

You have a time-series dataset with data points ordered by time. For machine learning, you should:

a) Keep the time order to preserve patterns

Answer: c) For time-series prediction, order matters! For general classification, shuffle.

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a) Keep the time order to preserve patterns
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c) It depends on the problem

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Example with 2 data points:

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Why This Happens

Biased learning: Point 2 always follows Point 1, creating predictable oscillations

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Implementation

`np.random.shuffle(training_data)` before each epoch

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How often should you shuffle your training data in SGD?

a) Once at the beginning of training

Answer: b) Before each epoch ensures maximum randomness while being computationally efficient!

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Remember

Good shuffling is the foundation of good machine learning!